DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
3030 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3030

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MEMORANDUM FOR ASSISTANT SECRETAX OF DEFENSE (COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE)
VICE CHIEF OF STAFF, ARMY
ASSISTANT SECRETMY OF THE AIR FORCE (ACQUISITION)

SUBJECT: Federally Funded Research and Development Centers Core Definition Statements and Program Review

I have attached a copy of the DoD sponsored Federally Funded Research and Development Centers (FFRDCs) approved "core" statements for your information. Please ensure that future changes/revisions to these statements are provided to my office so that we can maintain a current master file.

Previously, I had requested that each sponsor identify any ongoing FFRDC work that is not in compliance with the core definition together with a statement of how the non-core work will be transitioned out of the FFRDC. Please submit the results of your review as soon as possible, but no later that December 8, 1995.

"We must move forward quickly to complete the FFRDC Action Plan. The Defense Science Board Independent Advisory Committee (IX) has been chartered to review and advise on DoD's management of FFRDCs, and it will convene its first meeting on December 12, 1995. I have attached a copy of the IAC's Terms of Reference. We plan to brief the Congress on status to date in January, and I intend to complete the "Action Plan" by the end of December.

Questions related to the above should be directed to Mr. Robert Nemetz at (703) 681-9096.

Anita K. Jones

Core Work of the Aerospace Systems Engineering FFRDC

This paper describes the character of the core work conducted by the Aerospace Corporation's systems engineering Federally Funded Research and Development Center (FFRDC)--hereafter referred to as Aerospace--sponsored by the United States Air Force.

Core work is defined as that which is appropriate for Aerospace in pursuit of Aerospace's mission and charter to support the USAF, and in light of the strategic relationship maintained between Aerospace and the USAF. This systems engineering work is: (1) consistent with Aerospace's mission, purpose, and capabilities; (2) consistent with the USAF's need for Aerospace support as reflected by the core competencies that Aerospace maintains; and (3) consistent with the FFRDC special relationship between the USAF and Aerospace.

Aerospace Mission

Aerospace's mission is to support the USAF. The mission involves applying the full resources of modem science and technology to achieve continuing advances in military space and space related systems which are basic to national security; to provide the USAF's space efforts with an organization which is objective, possesses high technical competence, and is characterized by permanence and stability; to provide a vital link between the U.S. Government and the scientific and industrial organizations in the country with a capability and an interest in the space field; and, through its unique role, to help to ensure that the full technical resources of the nation are properly applied to developing highly reliable and cost effective space and space related systems, and that the potential advances in the space field are realized in shortest possible time.

Aerospace Core Capabilities and Competencies

Aerospace provides support not available from the USAF's in-house technical and engineering capabilities. This support assists with the creation of and choice of space system concepts and architectures; the specification of technical space system and subsystem requirements and interfaces; the development of and acquisition of space system hardware and software; the testing and verification of performance; the integration of new capabilities and continuous improvement of system operations and logistics; and the technical formulation, initiation, and evaluation of space programs and activities undertaken by firms in the for-profit sector supporting the USAF.

After a development program is initiated, Aerospace supports the USAF through technical review, monitoring and steering of industry efforts, consistent with the economical and timely accomplishment of program and mission objectives. Aerospace ensures that technical deficiencies and weaknesses are isolated. and that the impact of new data, new developments. and modified requirements on total systems concepts. technical performance, and cost and schedule are properly assessed. and that appropriate changes are promptly introduced.

Aerospace provides two levels of systems engineering for space systems: (1) integration of subsystems and system segments into complete systems;, and (2) the integration of each system into the overall system of all national security space systems, optimizing interoperability, performance, risk, resilience, and standardization. This integration process extends from initial engineering feasibility studies and conceptual design, through hardware development and operations to mission termination. It encompasses satellites, launch vehicles, ground systems, and their integration to meet total mission requirements.

Aerospace attracts and retains personnel of the highest technical capability. It seeks, through its policies and structure, to provide the type of environment that can ensure the development and retention of engineering and scientific experts and special facilities in the disciplines relevant to national security space systems, and to maximize support to the government by providing a cost-effective highly efficient organization.

Aerospace's capabilities are the result of the unique, long-term support relationship established with the USAF described above, and the ability of this support workforce to provide the following characteristics:

- broad and deep working knowledge of all aspects of space technologies, including commercial, USAF, civil, DOD, and international developed

. detailed knowledge of a broad array of space systems currently in use, being upgraded, or in development

. intimate familiarity with the application of the underlying engineering processes for architectures, acquisition, systems migration and operational test and evaluation

- thorough understanding of the operational role played by the overall space system

. widespread and substantial involvement with national security developers, users and fielders of space systems

Aerospace provides the following core competencies:

Launch Certification: Aerospace provides validation of in-line processing of flight hardware, analysis of projected range support, and formal certification of adequacy of processing and readiness for flight to support mission and launch reviews.

Systems of Systems Engineering: Aerospace provides the architecture planning and development, internal and external interface analysis, modeling and simulation analysis, and independent testing necessary to support the development of space systems.

Systems Development and Acquisition: Aerospace provides operational requirements analysis and evaluation, mission threat analysis, risk assessment, and technical performance analysis and assessment to support acquisition planning, program preparation and evaluation, test planning and evaluation, and program milestone and design reviews for all space systems.

Process Implementation: Aerospace provides technical expertise to support acquisition reform initiatives such as military specifications and standards reform, development and evaluation of critical processes, as well as to support proof-of-concept prototyping in support of space systems.

Technology Application: Aerospace's provides state of the art assessments of technology opportunities, alternatives, and risks to support the application of new technology in current or developing space systems

Aerospace's **Special Relationship** with the United States Air"Force

The special relationship between the USAF and Aerospace was established and is maintained to bring private sector expertise to the systems engineering efforts of the USAF that cannot be carried out as effectively by in-house or for-profit contractors. The special relationship has the following characteristics:

Objecti e. High-Quality Work. Aerospace is required to maintain an exceptionally competent staff and to produce consistently objective high-quality work.

Freedom from Real or Perceived Conflicts of Interest. The USAF requires Aerospace to be independent of commercial, shareholder and other associations that could lead to real or perceived conflicts of interest.

Broad Access to Information. Aerospace's work is fully informed by access to sensitive government information and to proprietary data from industry.

Comprehensive Knowledge of Sponsor Needs and Problems. The USAF requires Aerospace to maintain a comprehensive knowledge and expertise in the core areas described in this paper, providing corporate memory on long-term systems issues.

Long-Term Continuity. The special relationship between Aerospace and USAF was expected to be and has been long-term. The relationship was established and has been continuous since 1960.

Technical Link. Aerospace provides the technical link between the USAF space program and the other scientific and industrial organizations worldwide that affect the future of the national security space program.

Criteria for Defining Core Work

Core systems engineering work is defined by the combination of Aerospace's mission; Aerospace's core capabilities and competencies; and the FFRDC special relationship maintained between Aerospace and the USAF. Aerospace conducts core work for the USAF, and other Department of Defense agencies. Neither the Aerospace FFRDC nor the Aerospace Corporation conducts non-core work. Core work has the following characteristics:

Consistency with Aerospace's Mission. The work assigned to Aerospace must be consistent with its basic mission and purpose, must be sponsored by an appropriate organization, and must be performed effectively using the capabilities that Aerospace maintains, as described previously. Aerospace may conduct core work for non-DOD entities when it is directly related to the core areas defined in this paper and when it is supportive of national security goals; this work is conducted subject to the review and approval process described in Aerospace's Sponsoring Agreement and Space and Missile Center Regulation 8"00-8.

Consistency with Aerospace's Core Capabilities and Competencies. The work assigned to Aerospace must fall within Aerospace's core competencies -- launch certification, systems of systems engineering, systems development and acquisition, process implementation, and technology application.

Consistency with Aerospace's Special Relationship The work assigned to Aerospace must be appropriate for an organization maintaining a strategic relationship with the Air Force, as evidenced by the need for one or more of the following:

- Objective and high-quality work on subjects integral to the mission of the Air Force
- Freedom from real or perceived conflicts of interest
- Broad access to information of a sensitive nature to the Air Force
- Comprehensive knowledge of Air Force needs and problems
- Long-term continuity of knowledge of Air Force issues
- Technical link between the Air Force space, program and scientific and industrial organizations worldwide